



EM1 8021 EMULATION BOARD

**EPROM functional equivalent of 8021 —
single component 8-bit microcomputer**

**Based on 8748 — user programmable/
erasable EPROM 8-bit computer**

**Operates with ICE-49™ module to provide
full in-circuit debugging of 8021 prototype
system**

**Connects to prototype system through
8021 pin compatible plug**

**On-card 3.0 MHz or external TTL driven
clock**

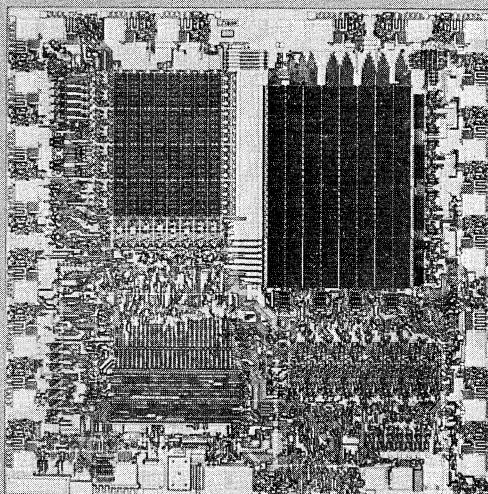
**Portable 4" x 7" microcomputer circuit
assembly**

The EM1 emulator board is a ready-to-use 4" x 7" microcomputer circuit assembly that emulates the Intel 8021 microcomputer. A 12-inch flat-cable assembly connects the board to the 8021 socket in a prototype system. The board is designed so that it can be mounted either as a stand-alone unit, or within the prototype assembly.

The 8021 microcomputer has 1K x 8 mask-programmable ROM program memory and 64 by 8 RAM data memory. The EM1 is controlled by an Intel 8748, with 1K of EPROM program memory and a 64 byte data memory. The EPROM can be programmed and erased repeatedly during hardware and software development. The EM1 has several ancillary circuits that perform the following functions which are specific to the 8021:

- Zero crossing detector
- Crystal controlled clock/buffer
- Port 0 simulator

For prototype debugging, the 8748 can be removed from its socket and replaced with a cable to an ICE-49 module. When used with the EM1, ICE-49 module emulates the 8021 in real-time, or single-steps the 8021 program at the user's command. A full range of capabilities for examining and modifying 8021 memory and status are supplied through ICE-49 module.



HARDWARE

The EM1 emulation board uses the 8748 to perform the emulation.

P0 Simulator

Port 0 of the 8021 is a quasi*-bidirectional port. The P0 simulator converts the data bus of the 8748 into a quasi-bidirectional port.

Crystal Control Clock Buffer

The EM1 allows user to select an on-board oscillator or a TTL clock driven from the 8021 user's prototype system via a Cambion Suitcase jumper.

Jumper	Position	State
W1	A — B	On-Board
	C — D	External
		TTL Clock

*A bidirectional port which serves as an input port, output port, or both even though outputs are statically latched.

Zero Cross Detection Simulator

The zero cross detection simulator enables the 8748's T1 input to detect zero-crossings. The circuitry provides a high level signal on a positive crossing and a low level signal on a negative crossing of zero to the T1 input of the 8748.

Reset Buffer

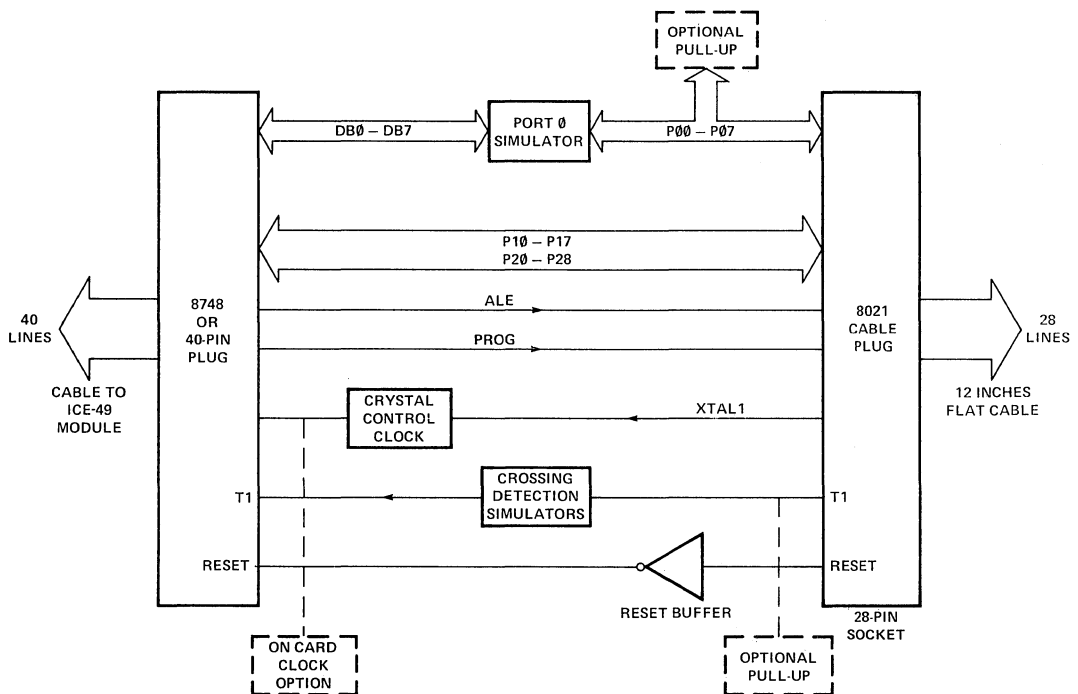
The 8021 resets on a logic HIGH level signal. However, the 8748 resets on a logic LOW level, thus an inverter is provided on the EM1 to make the two chips compatible.

Optional Pull-Ups

Resistors are provided to simulate the optional pull-up resistors on T1 input and Port 0 of the 8021. A removable resistor pack is used on Port 0. The T1 input pull up can be installed by soldering in a 50K resistor.

Software

When emulating the 8021 with EM1, the user must observe the 8021 instruction set.



SPECIFICATIONS

Operating Environment

Stand-Alone

Required Hardware:
EM1 emulation board

In-Circuit Emulation

Required Hardware:
EM1 emulation board
Intellec Microcomputer Development System configured with ICE-49 module

Equipment Supplied

EM1 printed circuit board

12" long flat cable terminating in 28-pin plug, pin compatible with 8021

EM1 Operator's Manual

System Clock

Crystal controlled 3.0 MHz on board or user supplied TTL external clock: hardware jumper selectable.

Physical Characteristics

Width: 7.0 in (17.78 cm)
Height: 4.0 in. (10.16 cm)
Depth: 0.75 in. (1.91 cm)
Weight: < 1.0 lbs. (0.45 kg)

Electrical Characteristics

DC Power:

V_{CC} 5V \pm 5%
 I_{CC} 300 mA (max.)

Environmental Characteristics

Operating Temperature: 0 — 55°C

Operating Humidity: up to 95% relative humidity without condensation

ORDERING INFORMATION

PART NUMBER	Description
MDS-EM1	8021 Emulation Board